

Having thus, described the invention, what is claimed is:

1. A check valve, comprising:

a valve body having an axial through-communicating oil path and a cylindrical fitting recess part opened at an axial end thereof;

an insert member having a cylindrical fitting projection part fitted in said fitting recess part to attach the insert member to the valve body, and also having an accommodating space therein opened at one side of the insert member near said fitting projection part; and

a valve element and a spring disposed in said accommodating space such that said valve element is normally urged by said spring to close an opening of said communicating oil path;

said cylindrical fitting recess part having one of an annular reduced diameter portion and an annular expanded diameter portion at an inner periphery thereof;

said cylindrical fitting projection part having a corresponding one of an annular reduced diameter portion and an annular expanded diameter portion at an outer periphery thereof; and

diameters of said fitting recess part and said fitting projection part, including said annular reduced diameter portions or said annular expanded diameter portions, are such that said insert member is press-fitted to said fitting recess part when attaching the insert member to the valve body.

2. A check valve according to claim 1, wherein said cylindrical fitting recess part has an annular reduced diameter portion at the inner periphery thereof; and

said cylindrical fitting projection part has a corresponding an annular reduced diameter portion at the outer periphery thereof.

3. A check valve according to claim 1, wherein said cylindrical fitting recess part has

an annular expanded diameter portion at the inner periphery thereof; and

said cylindrical fitting projection part has a corresponding an annular expanded diameter portion at the outer periphery thereof.

4. A check valve according to claim 1, wherein said annular reduced diameter portions or said annular expanded diameter portions of said cylindrical fitting recess part and cylindrical fitting projection part oppose each other when said insert member is attached to said valve body.

5. A check valve according to claim 2, wherein the diameter of a portion of said fitting projection part other than said annular reduced diameter portion thereof being smaller than the diameter of a portion of said fitting recess part other than said annular reduced diameter portion thereof.

6. A check valve according to claim 3, wherein the diameter of a portion of said fitting projection part other than said annular expanded diameter portion thereof being smaller than the diameter of a portion of said fitting recess part other than said annular reduced diameter portion thereof.

7. A check valve according to claim 5, wherein said diameter of said portion of said fitting projection part other than said annular reduced diameter portion thereof is larger than or equal to the diameter of said annular reduced diameter portion of said fitting recess part.

8. A check valve according to claim 6, wherein said diameter of said annular expanded diameter portion of said fitting projection part is larger than or equal to the diameter of said portion of said fitting recess part other than said annular expanded diameter

portion thereof .

9. A check valve according to claim 2, wherein said annular reduced diameter portions are longitudinally intermediate portions of said fitting projection part and said fitting recess part.

10. A check valve according to claim 3, wherein said annular expanded diameter portions are longitudinally intermediate portions of said fitting projection part and said fitting recess part.

11. A continuously variable transmission comprising the check valve according to claim 1.

12. A check valve for use in a hydraulic flow passage, comprising:  
a valve body having an axial oil path formed therein, and having a cylindrical fitting recess formed in one end thereof in communication with said oil path, wherein a valve seat is defined where said fitting recess joins said axial oil path;

an insert member adapted to fit in said fitting recess of said valve body, said insert member including a cylindrical fitting projection and having an accommodating space defined therein; and

a valve element and a spring disposed in said accommodating space when said fitting projection is installed in said fitting recess to attach said insert member to said valve body;

said valve element being normally biased against said valve seat by said spring to block fluid flow through said axial oil path; and

said cylindrical fitting projection of said insert member is press-fit into said fitting

recess of said valve body to form an interference fit therebetween effective to retain said insert member in engagement with said valve body.

13. The check valve of claim 12, wherein:

a first cylindrical surface within said check valve, selected from an inner wall of said cylindrical fitting recess and an outer wall of said cylindrical fitting projection, has an annular raised rib provided therearound;

a second cylindrical surface within said check valve, which is the other of said inner wall of said cylindrical fitting recess and said outer wall of said cylindrical fitting projection, has an annular groove formed therearound corresponding to said raised rib; and

said raised rib is disposed opposite to said annular groove when said insert member is attached to said valve body.

14. The check valve of claim 12, wherein said valve member is substantially spherical in shape.

15. The check valve of claim 13, wherein outer wall of said cylindrical fitting projection includes said annular raised rib, and said annular groove is formed in said inner wall of said cylindrical fitting recess.

16. The check valve of claim 13, wherein said annular groove is formed in said outer wall of said cylindrical fitting projection, and said annular raised rib is formed on said inner wall of said cylindrical fitting recess.

17. A check valve for use in a hydraulic flow passage, comprising:

a valve body having an axial oil path formed therein, and having a cylindrical fitting

recess formed in one end thereof in communication with said oil path, wherein a valve seat is defined where said fitting recess joins said axial oil path;

an insert member adapted to fit in said fitting recess of said valve body, said insert member comprising a cylindrical fitting projection having an accommodating space defined therein; and

a valve element and a spring disposed in said accommodating space when said fitting projection is installed in said fitting recess to attach said insert member to said valve body;

said valve element being normally biased against said valve seat by said spring to block fluid flow through said axial oil path;

a first cylindrical surface, selected from an inner wall of said cylindrical fitting recess and an outer wall of said cylindrical fitting projection, has a raised annular rib extending therearound, and a second cylindrical surface which is the other of said inner wall of said cylindrical fitting recess and the outer wall of said cylindrical fitting projection, has an annular groove formed therearound corresponding to said raised annular rib; and

said cylindrical fitting projection of said insert member is press-fit into said cylindrical fitting recess of said valve body to form an interference fit therebetween effective to retain said insert member in engagement with said valve body.